

Small Space Platform Enhanced Internet Protocol Stack Device, Phase II

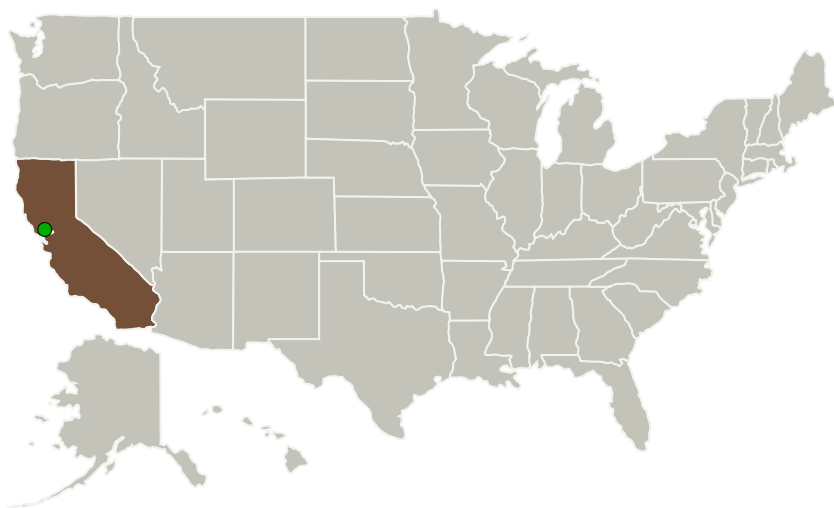
Completed Technology Project (2010 - 2012)



Project Introduction

Wireless communication of small, nano and micro satellites will play a vital role to NASA mission and marketability of the satellite. The use of an Internet-based protocol, especially TCP/IP, can provide seamless network command and control continuity between terrestrial and space-based platforms and environments, as well as between distributed ground and space stations. However, long propagation and/or large transmission errors can significantly degrade current TCP/IP performance. In addition, current TCP is too complex to fit in a small footprint, which is required in microsats and nanosats. To address this NASA/ARC need for wireless networking technologies for small launch vehicles, Broaddata Communications, Inc. proposes to develop a Small Space Platform Internet Protocol Stack with Space-Enhanced TCP technology (or SSP IP & TCP in short) to dramatically increase TCP/IP performance (20 times improvements over standard TCP/IP was demonstrated in Phase I) and enable the use of TCP/IP for processor-footprint constrained spacecraft in NASA missions. The overall goal of this Phase II project is to further develop the SSP IP & TCP technology, and to produce a full-scale, highly-optimized, IP embeddable SSP IP & TCP prototype system for placement in NASA networks with micro- or nano-satellite platforms. Our Phase II work plan is designed to complete SSP IP & TCP development and to produce: (a) a miniature, nanosat integrateable, standalone embedded network system module that provides all SSP IP & TCP functionalities and can directly meet NASA needs and resource-constraint integration requirements, and (b) a full-scale SSP IP & TCP software package that supports multiple network communication interfaces and provides automated installation for Linux or Windows operation systems.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Broaddata Communications, Inc.	Lead Organization	Industry	Torrance, California
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California

Project Transitions

March 2010: Project Start

 March 2012: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139466>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Broaddata Communications, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

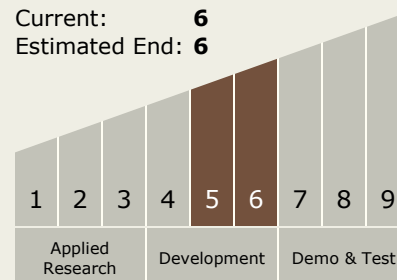
Carlos Torrez

Principal Investigator:

Freddie Lin

Technology Maturity (TRL)

Start: 5
Current: 6
Estimated End: 6



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.4 Flight and Ground Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System